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BOOK NOTICES.

Economic Geology of the United States. By Heinrich Ries, A. M., Ph. D., Assistant Professor of Economic Geology at Cornell University. xxii and 436 pp. The Macmillan Company, New York, 1905. (Price, $2.60.)

The non-metallic minerals are treated first in this work, both on account of their greater simplicity and the superior value of their output. It is difficult to compress so much material within one volume, but Dr. Ries has gained space by omitting matters of geological introduction, rightly assuming that these belong to earlier studies. The title is representative, as reference is made only to such foreign minerals as serve for chief sources of supply in this country. There are about 100 figures in the text, chiefly maps and sections, and 25 plates, mostly half-tones.

The treatment begins with coal. That so large a subject is put into 36 pages shows the rigid limits of space to which the author of a text-book is subject. The discussion is compact and comprehensive, even though short, and includes the following topics: definitions of kinds, analysis of thirty-one representative samples, origin and conditions of accumulation, structural features of coal-beds, descriptions of coal fields, production by years, States, and fields, as well as of leading countries, and bibliography. The last is a feature of all the chapters. In 1903 the United States produced 357,000,000 short tons, as against 257,000,000 for Great Britain and 178,000,000 for Germany. No other country produced 50,000,000 tons.

Building-stones are treated under the general heads of colour, texture, density, hardness, strength, porosity, and rate of absorption, resistance to frost and resistance to heat. The leading rocks are described under the head of granites, limestones and marbles, serpentine, sandstones and slates.

Under clays the author's reserve is well shown by the fact that but 17 pages are given to the subject, although Dr. Ries is the leading authority and most voluminous writer on clays in the United States. A sample of the compactness and fulness of the work may be found in the brief but informing definitions of numerous varieties of clay on page 99. Other sections are devoted to rock salt and various other salines, to gypsum, fertilizers, abrasives, and several minor minerals. The last include glass sand, graphite, and lithographic stone. Regarding this stone the opinion is expressed that native quarries, well developed and well managed, are capable of furnishing the limited supply needed in America, as apart from the product of the celebrated Solenhofen quarries of Germany. Zinc and aluminum plates have been substituted for some uses, thus reducing the demand for lithographic stone.

Chapters deal with mineral and underground waters, and, very properly, with soils, certainly the most important of all materials with which economic geology has to do.

Not quite half the volume is reserved for the metallic minerals. This part begins with a chapter on ore deposits, in which theories of origin and modes of occurrence are discussed in a way not unduly technical. Iron is given first place when the specific account of metallic minerals is undertaken. Favourable location, high quality, considerable quantity, and structure permitting easy extraction are the four conditions assigned for the present predominance of Lake Superior ores.

The great preponderance of hematite among iron ores in this country is shown in the fact that for 1903 this type afforded 86.6 per cent. of the total production. The two leading producing regions at present are the Lake Superior district and the area about Birmingham, Alabama. The opinion of Van Hise is quoted, that the Lake Superior ores may be exhausted in the first half of the present century. The same authority looks forward to the marketing, in the near future, of ores running below 40 per cent. in iron. No other producing district in the world rivals the Superior region, which now affords at least three-fourths of the iron ore used in the United States. The current forming of limonite, or bog ore, is strikingly evidenced in the deposition, in Swedish ponds, of depths of 18 inches of this ore in periods varying from fifteen to thirty years.

It may surprise most readers to learn that the native copper of Michigan, as now mined, is contained in ores rarely running above 1 per cent. of native copper. Ninety per cent. of the copper of the United States comes from the States of Montana, Michigan, and Arizona, in the order named. Butte, in Montana, is the greatest producer in the world, the Anaconda mines alone yielding one-seventh of the world's supply. Butte began in 1887 to produce in excess of Lake Superior.

Fifty pages are devoted to gold and silver, including the silver-lead ores. Under aluminum, the bauxite localities are described, three in number: Georgia-Alabama, Arkansas, and New Mexico. The first was discovered in 1887, and the deposits have been worked since that time.

The book should be useful to a variety of readers, not only to students of economic geology, but to teachers of general geology and geography, and to all who are interested in the earth materials commonly used by man.

A. P. B.

The Geology of South Africa. By F. H. Hatch and G. S. Corstorphine. xiv and 348 pp. Macmillan & Co., London, 1905. (Price, $5.25.)

A related work, dealing with the geology of Cape Colony, was noticed by the present reviewer in the BULLETIN for December, 1905, page 753. The volume now noticed is of wider scope, but resembles the earlier work in being a summary account derived from many sources. Of the authors, Mr. Hatch has had wide connection with surveys in the British Empire, and Mr. Corstorphine was formerly Director of the Geological Survey of Cape Colony.

The beginnings of systematic South African geology are attributed to Andrew Geddes Bain, who died in 1864. The introductory chapter treats historically the growth of knowledge of that great region. The Transvaal began a survey in 1897 and Natal in 1898. The work suffered serious interruption in the years 1899-1903, the period of the war. The volume is adequately illustrated with sections, views, cuts of fossils, and maps. There is a folding map showing the geology of South Africa as a whole on the scale 78.88 miles=1 inch. There is also a large folding map of the formations of the Transvaal on the scale 19.7 miles=1 inch.

We find here what the work on Cape Colony lacks—namely, clear reference of the local formation names to the designations used in the world-wide